

Abstract

The present invention provides a technique for enabling permanent magnets constituting the field magnet system of an IPM electric rotating machine to be embedded in a rotor core in a shallower depth. The IPM electric rotating machine is composed of a stator and a rotor. The rotor includes a rotor core and permanent magnets constituting the field magnet system. The rotor core has a side face opposed to the stator, and the permanent magnets are shallowly embedded so that the distance between the pole face thereof and the rotor side face is reduced. Furthermore, two adjacent permanent magnets are intensively spaced so that the following formula holds:

$$0.3 < (L_q - L_d) / L_d,$$

where L_q is the q-axis inductance of the rotor, and L_d is the d-axis inductance thereof.